CLAIM AMENDMENTS

Claims 16-29 are currently pending in the application.

Please amend claims 16, 17, 19, 21, 22, 24 and 26-29 as shown below.

The following listing of claims 1-29 will replace all prior versions, and listings, of claims in the application:

1.-15. (Cancelled)

16. (Currently Amended) An image processing method of extracting points of a path following a threadlike structure in an image formed by a grid of potential points, the image processing method comprising:

marching a front of points forward starting at a predetermined start point until a predetermined end point of the grid is reached to thereby identify ~~a first~~ at least one track formed by succeeding points denoted fathers and corresponding children of the threadlike structure; and

back propagating the front along ~~the~~ a first track starting at the end point through the children and the fathers of the first track until the start point is reached whereby the points of the path following the threadlike structure in the image are extracted.

17. (Currently Amended) The method of claim 16, wherein the marching the front of points forward starting at the predetermined start point until the predetermined end point of the grid is reached includes:

conditionally selecting a first child of the grid to succeed a first father of the grid ~~to form the first track.~~.

18. (Previously Presented) The method of claim 17,

wherein the first child is conditionally selected in accordance with a law of location for the first father that pertains to the front, and a first cumulated cost for the first that is minimal compared to other points of the front.

19. (Currently Amended) The method of claim 17,

wherein the first child is conditionally selected in accordance with a law of location for the first child that is on a same row or a same column of the grid as the first father with a one grid point interval, and a second cumulated cost for the first child including a first term of a minimum among cumulated costs of the succeeding points already selected from the start point to the first father and a second term of the potential at the first child~~; and~~.

20. (Previously Presented) The method of claim 17,

wherein the first child is conditionally selected in accordance with a law of filiation that determines the first child becomes a possible second father of the front for further forwarding the front.

21. (Currently Amended) The method of claim 17,

wherein a function of cumulated costs (CC_k) associated with the first child is calculated as follows as a potential mean value (1):

$$CC_k = \frac{1}{L_k}\sum_{j=1}^{j=k} Q_j \qquad (1)$$

where variable k is the total number of current points between the start point and the first child, (Q_j) are the potentials at the current points located between the start point and the first child, and (L_k) is a length of a path between the start point and the first father calculated using a city block distance law.

22. (Currently Amended) The method of claim 21,

wherein the length of the path between the start point and the first child is calculated using the city block distance law by adding 1 each time any father along the path fathoms a child, so that when the first father is located at a determined distance (L_k) from the start point, the first child is located at an updated distance, which is the distance of the first father plus one unity (L_k+1, L_{k+1}) and so that the function of cumulated costs (CC_k) associated with the first child may be written according to relation (2):

$$CC_k = \frac{(CC_{k-1})(L_{k-1}) + Q_k}{L_k} \qquad (2)$$

which is a function of cumulated cost for the first child calculated from the function of cumulated cost of the first father (CC_{k-1}), the potential at the first child (Q_k), and the distance from the start point to the father (L_{k-1}).

23. (Previously Presented) The method of claim 21,

wherein the function (CC_k) of cumulated cost to attribute to the first child is calculated using an average effected on predetermined limited temporal spans which permits a taking of local events into account.

24. (Currently Amended) The method of claim ~~25~~ 23,

wherein calculating the function (CC_k) of cumulated cost using an average effected on predetermined limited temporal spans is obtained using one parameter α which is a weight factor progressively minimizing the influence of points situated farther away than at a given distance from the first child so that the function (CC_k) of cumulated costs is given by the following relation (3) :

$$CC_K = \alpha CC_{K-1} + (1-\alpha)Q_K \qquad (3)$$

where the weight factor α is a constant and fixes the temporal span, and the number of fathers which is taken into account, where CC_{k-1} is the function of cumulated costs related to the first father and (Q_k) is the potential at the current point.

25. (Previously Presented) The method of claim 24, wherein:

the span may be approximated by the relation :

$1/(1-\alpha)$ where $0 < \alpha < 1$. (4)

26. (Currently Amended) The method of claim 20,

wherein~~, besides taking local events into account, global events are taken into account and to that end, takes into account~~ a curvature value (K_k) at the first child along the first track~~, the curvature value (K_k) being~~ is derived from a turning angle value which is defined as an angle between the tangent to the track at the first child

and a reference axis so that a term based on the curvature value (K_k) is taken into account to calculate the function (CC_k) of cumulated costs in order to penalize track trajectories having too many points associated to important curvature values.

27. (Currently Amended) The method of claim 26,

wherein, from the curvature value (K_k) and from a weight factor (W) which takes the potential at the first child and the curvature into account, the function (CC_k) of cumulated costs is provided by the following recursive relation :

$$CC_K = \alpha\ CC_{K-1} + (1-\alpha)\,[Q_K + W.K_K] \qquad (10)$$

~~where CC_k is a function of local measures and of global measures.~~

28. (Currently Amended) A system, comprising:

means for acquiring image data from an original image representing a threadlike structure on a background, the image data including digital intensity levels and pixel coordinates in the original image;

means for constructing an image of potentials in which each pixel of the original image is associated to a potential forming a grid of points;

means for setting end points within the image of potentials, the end points including a start point and an end point between which a path following the threadlike structure is to be determined; and

means for ~~utilizing a filiation front marching technique to march~~ marching a front from the start point through points dented as fathers and children to the end point and to subsequently propagate backwards from the end point through each child and father of a first track until the start point is reached.

29. (Currently Amended) An image processing system of performing a path-tracking operation to extract points of a threadlike structure in an image formed of a grid of potential points~~, using a front marching technique denoted filiation front marching technique for supplying~~ from at least one track formed of succeeding points denoted first points (fathers) and corresponding second points (children) of the threadlike structure by marching a front of points forwards, the method comprising:

means for setting a predetermined start point and a predetermined end point in the grid; and

means for propagating the front forwards between the start point and the end point when the following conditions are satisfied for selecting a second point (child) to succeed a first point (father) of the grid to form the track, wherein the conditions include

a law of location for the first point (father) which must already pertain to the front, and a criterion of cost for the first point (father) referred to as cumulated costs which must be minimal compared to the cumulated costs of other points of the front,

a law of location for the second point (child), which must be on the same row or column of the grid (city block distance) as the first point (father) with one grid point interval, and a criterion of cost referred to as cumulated costs for said second point (child) which must be minimal compared to cumulated costs obtained with other possible first points (fathers), and

a law of filiation according to which said determined second point (child) becomes a possible further first point (father) of the front for further forwarding the front, said cumulated costs including a term of the minimum among the cumulated costs of the succeeding points already selected from the start point to a so-called first point and a term of the potential at a so-called second point.